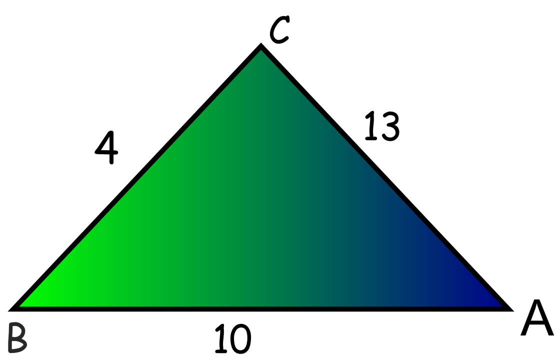
Precalc Warm Up # 11-5

1. Solve the triangle (nearest 10th), and find the area.



2. A person leaves their home and walks 100° True and travels 5 miles. They change course to 40° True and travel 3 miles further. How far are they from their house, and at what bearing must they travel to return?

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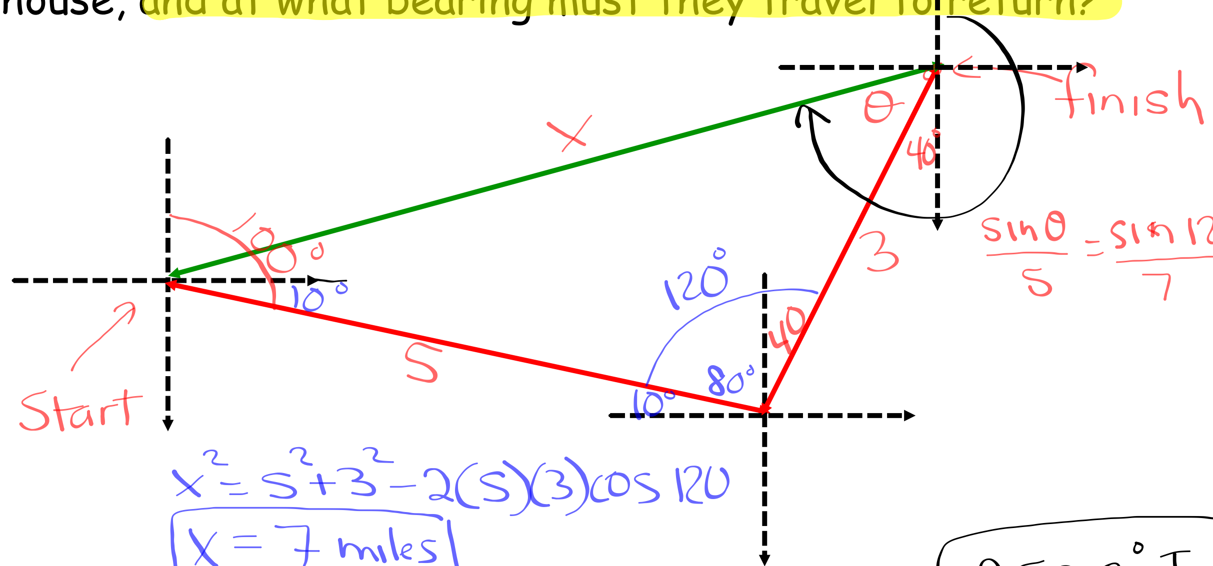


$$\frac{\sin\theta}{5} = \frac{\sin 120}{7}$$

$$x^2 = 5^2 + 3^2 - 2(5)(3)\cos 120$$

$$\boxed{x = 7 \text{ miles}}$$

$$\boxed{258.2^\circ T}$$

March 03, 2017

EXERCISES 9.5.4

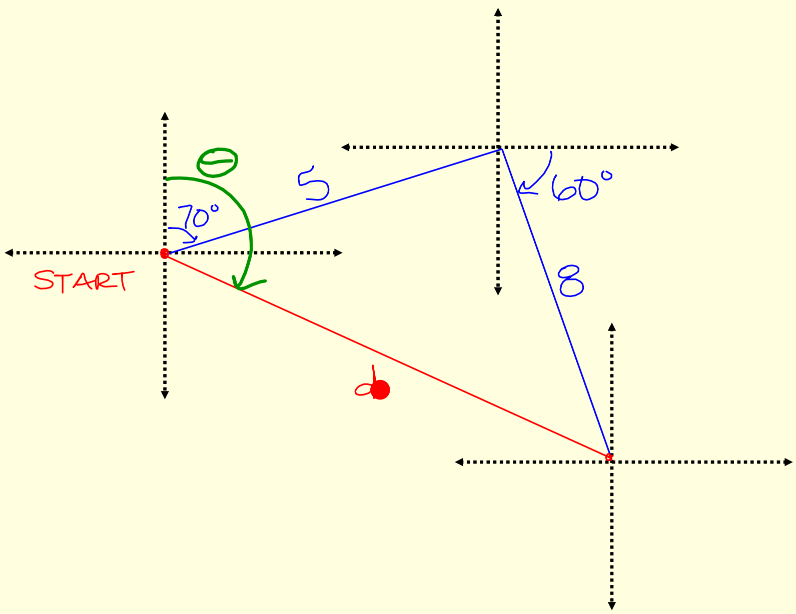
Solve the following triangles

	a cm	*b* cm	*c* cm	*A*	*B*	*C*
2.	8.9	10.8				101°
15.	2.0	0.7	2.5			

1. Thomas has just walked 5 km in a direction N70˚E when he realises that he needs to walk a further 8 km in a direction E60˚S.

(a) How far from the starting point will Thomas have travelled?

(b) What is his final bearing from his starting point?



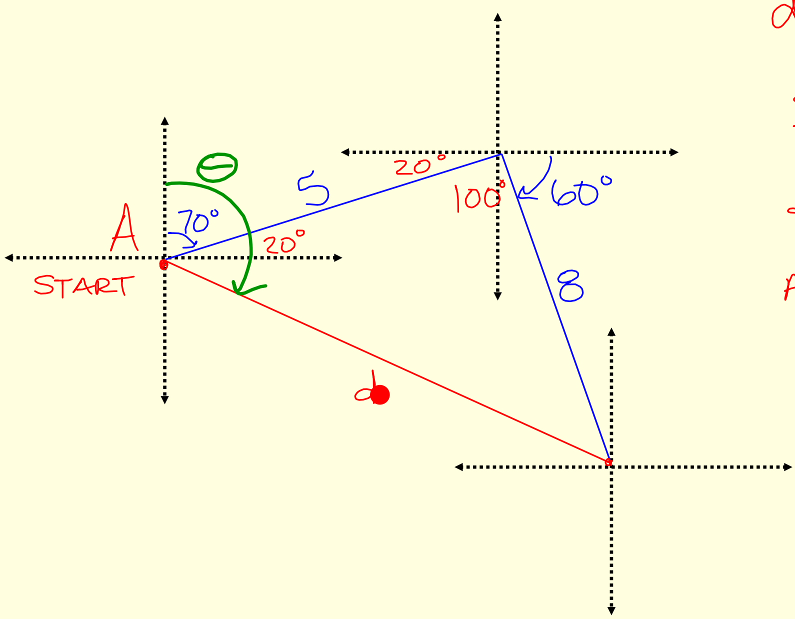
1. Thomas has just walked 5 km in a direction N70˚E when he realises that he needs to walk a further 8 km in a direction E60˚S.

(a) How far from the starting point will Thomas have travelled?

(b) What is his final bearing from his starting point?

$$d^2 = 5^2 + 8^2 - 2(5)(8)\cos 100^\circ$$

$d \approx$ STO → D



$$\frac{\sin A}{8} = \frac{\sin 100}{D}$$

$$\sin A = \frac{8\sin 100}{D}$$

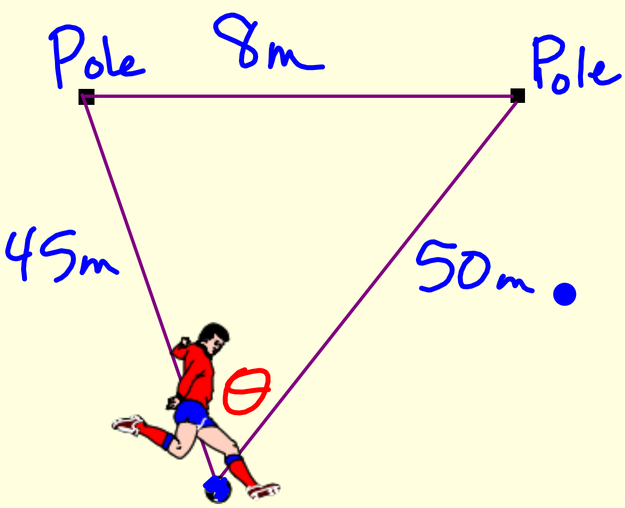
$$A = \sin^{-1}\left(\frac{8\sin 100}{D}\right)$$

$A \approx$

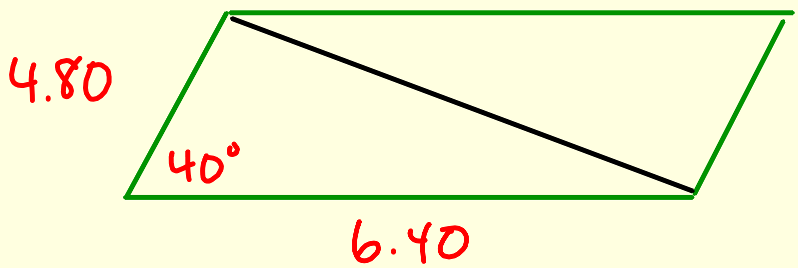
$$\theta = 70^\circ + A$$

$\theta \approx$

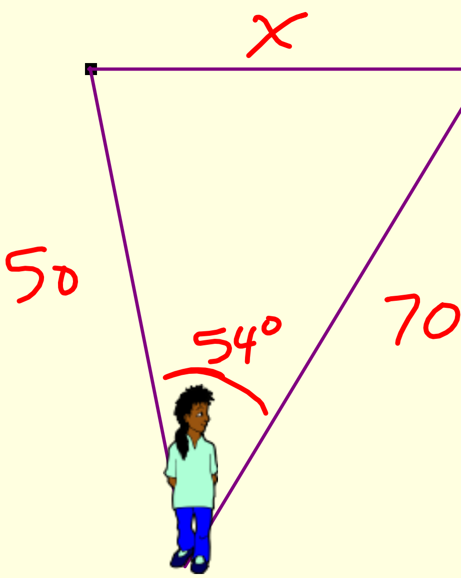
2. Two poles, 8 m apart are facing a rugby player who is 45 m from the left pole and 50 from the right one. Find the angle that the player makes with the goal mouth.



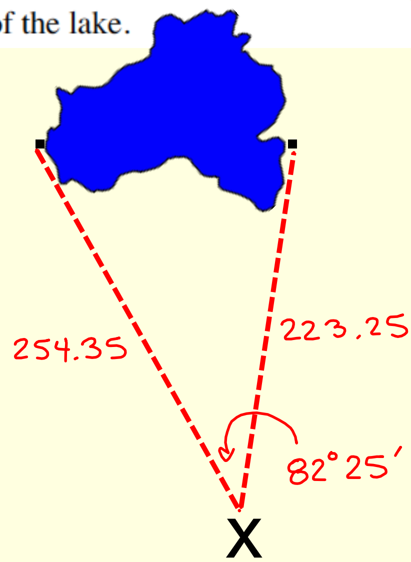
3. The lengths of the adjacent sides of a parallelogram are 4.80 cm and 6.40 cm. If these sides have an inclusive angle of 40° , find the length of the shorter diagonal.



4. During an orienteering venture, Patricia notices two rabbit holes and estimates them to be 50 m and 70 m away from her. She measures the angle between the line of sight of the two holes as 54°. How far apart are the two rabbit holes?



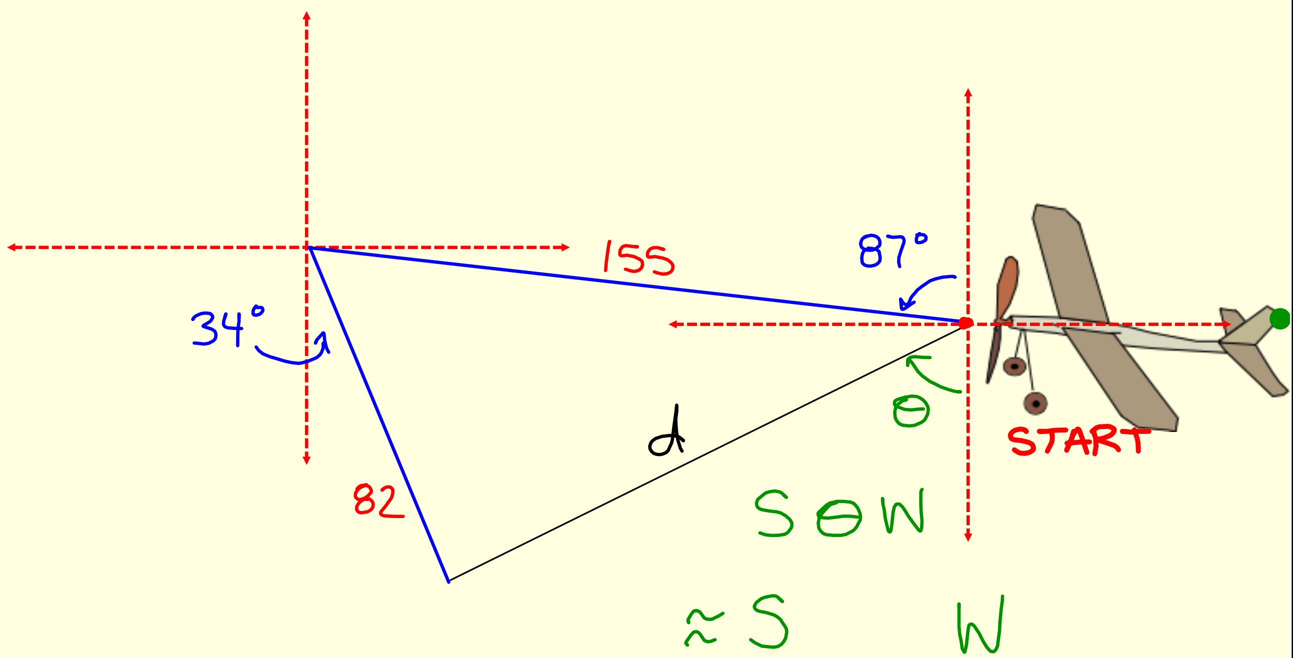
5. To measure the length of a lake, a surveyor chooses three points. Starting at one end of the lake she walks in a straight line for 223.25 m to some point X, away from the lake. She then heads towards the other end of the lake in a straight line and measures the distance covered to be 254.35 m. If the angle between the paths she takes is 82°25', find the width of the lake.



6. A light airplane flying N87°W for a distance of 155 km, suddenly needs to alter its course and heads S 34°E for 82 km to land on an empty field.

(a) How far from its starting point did the plane land.

(b) What was the plane's final bearing from its starting point?



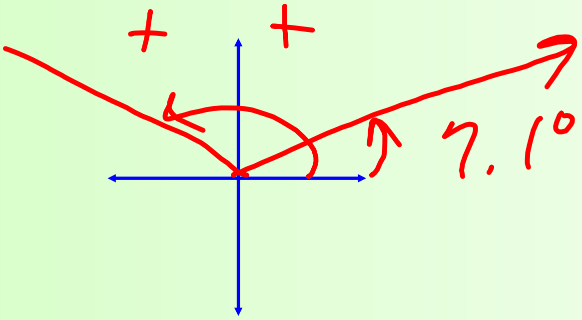
Law of Sines solves AAS, ASA, and SSA.

$$\frac{\sin A}{a} = \frac{\sin B}{b} = \frac{\sin C}{c}$$

The SSA may have 1, 2 or no solutions. It is AMBIGUOUS .

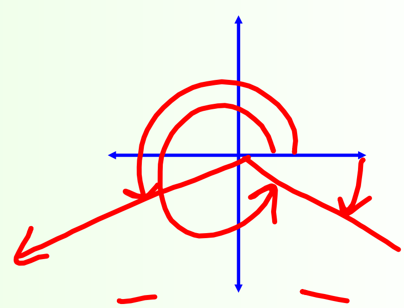
If sin A = .1234

A ≈ 7.1° or 172.9°



If sin A = -.1234

A ≈ _____ or _______

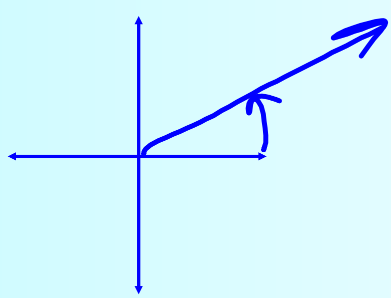


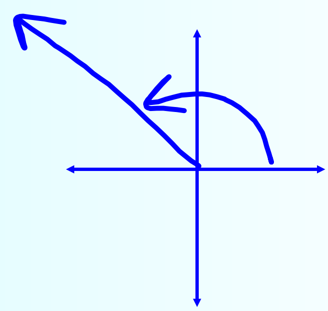
Law of Cosines solves SSS and SAS.

$$c^2 = a^2 + b^2 - 2ab\cos C$$

Never ambiguous. SAS will always have 1 solution.

cos A = .1234 or cos A = - .1234



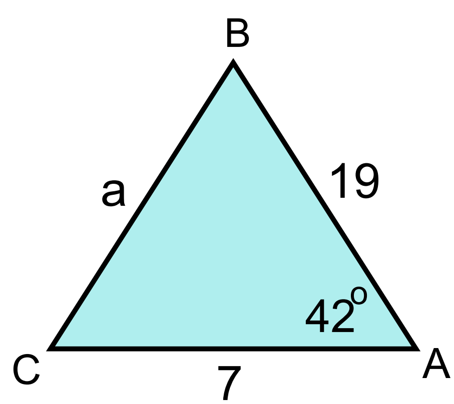


SAS

Find the first side using Law of Cosines. You can switch to Law of Sines to find a missing angle, but be careful!

Since $\sin^{-1}$ is defined between -90° and 90°, you may need to use the answer as a reference angle to find the obtuse angle.

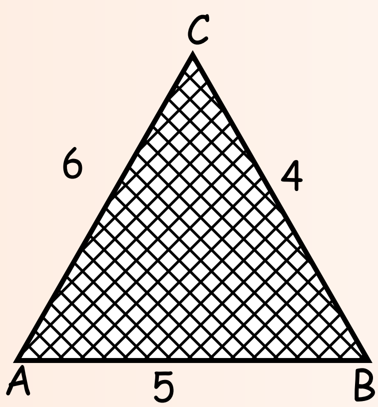
You will be safe if you find the smaller of the remaining angles next.



SSS

Find the largest angle first (opposite the longest side). Then you are free to find any remaining angle with Law of Sines.

If you accidentally find one of the smaller angles first, you can still switch to Law of Sines to finish the problem, just make sure you think about whether it should be acute or obtuse.



To Solve:

Find B first. Then it doesn't matter what you find next.

Test covers:

$A = \sqrt{s(s-a)(s-b)(s-c)}$

$s = \frac{1}{2}(a+b+c)$

$A = \frac{1}{2}bh$

$A = \frac{1}{2}\underset{b}{a}\underbrace{b \sin C}_{h}$

Law of Sines

Law of Cosines

Area formulas

Angles of Elevation and Depression

Bearing

Solving Triangles

HW: p. 304 #1-17 odd

Group Test Solve Triangles
(Likely next Thursday)

Individual Test (Probably Friday)

(SL 9.2, 9.4, 9.5)